EFDA

Amalgam Restorations

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Objectives

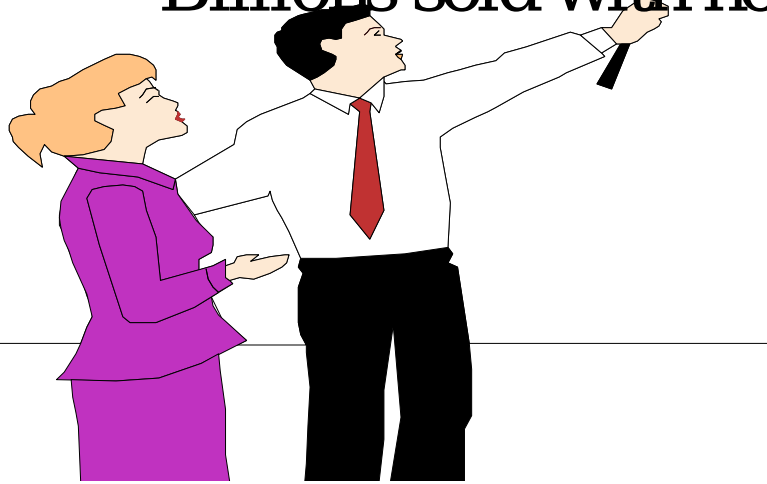
- List important aspects to consider when placing Class I dental amalgam
- Identify procedural steps used to place amalgam
- Identify procedural steps used to carve amalgam

Objectives

- Identify the procedural steps used to check occlusion
- List important aspects to consider when placing Class II dental amalgam
- Identify the minimum satisfactory standards of an amalgam restoration

Amalgam

- Alloy- mixture of metals
- Amalgam- alloy including mercury
- Used for more than 150 years
- 100 million amalgam restorations per year in the USA for the last 20 years
- Billions sold with no adverse effects



Composition of Dental Amalgam

Are these important aspects when placing amalgam?

- ***Silver 40 - 60%*** increases strength
- ***Tin 22 - 30%*** decreases expansion
- ***Copper 11 -27%*** increases strength & hardness
- ***Zinc <1%*** decreases oxidation & marginal breakdown
- ***Mercury 40-50%*** Wets the alloy particles/ decreases strength if in excess amounts

Every alloy is different, see manuf. for details.

Amalgam Setting Reaction with High Copper (Cu)

$$Ag_3Sn + Cu + Hg \longrightarrow Ag_3Sn + Ag_2Hg_3 + Cu_6Sn_3$$

Silver-Tin + Copper + Mercury → *Silver-Tin+Silver-Mercury+Copper-Tin*

- More Cu/less mercury is present in high Cu alloy.
- In high Cu alloy, Copper-Tin replaces Hg-Tin
- This phase is known as the “eta phase”

Trituration

- “Mixing the amalgam”
- Over trituration decreases work time/less strength.
  - Pellet is hot and shiny
- Under trituration retains more Hg
  - Pellet crumbles

*Before mixing- Check Pr

“Ensure prep is workable

Cavity Preparation Requirements

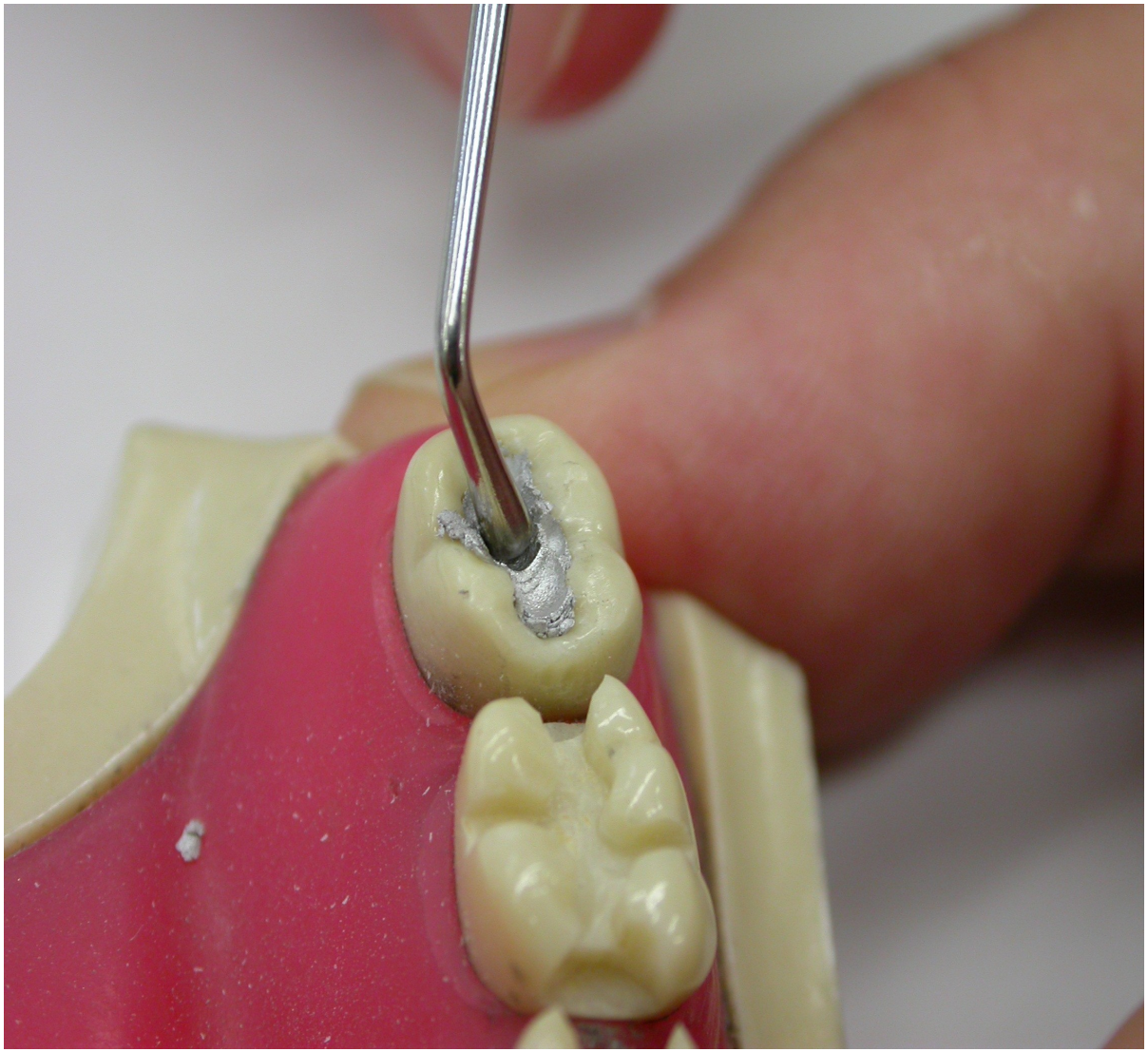
- Depth- At least 2 millimeters at all locations to allow for proper thickness of amalgam.
- Width- At least 1 millimeter to allow for proper condensation and strength of material.
- Extension- Minimal extension advocated, consistent with removing decay and placing margins on sound tooth structure.

Condensing Amalgam

- Definition- insertion and compression of amalgam in a cavity preparation so that the cavity is com nass..

Purpose

- Promotes adaptation of amalgam to walls and margins of a cavity preparation.
- Removes voids creating a unified mass of amalgam.
- Reduces residual mercury if present.



Effect of Condenser Tip

- The larger the nib, the greater the pressure required for adequate condensation.
- Begin filling the restoration with amalgam using a small condenser or to direct the material into undercuts and line & point angles of the preparation.
- Always use overlapping strokes when condensing.

Restoring the Tooth

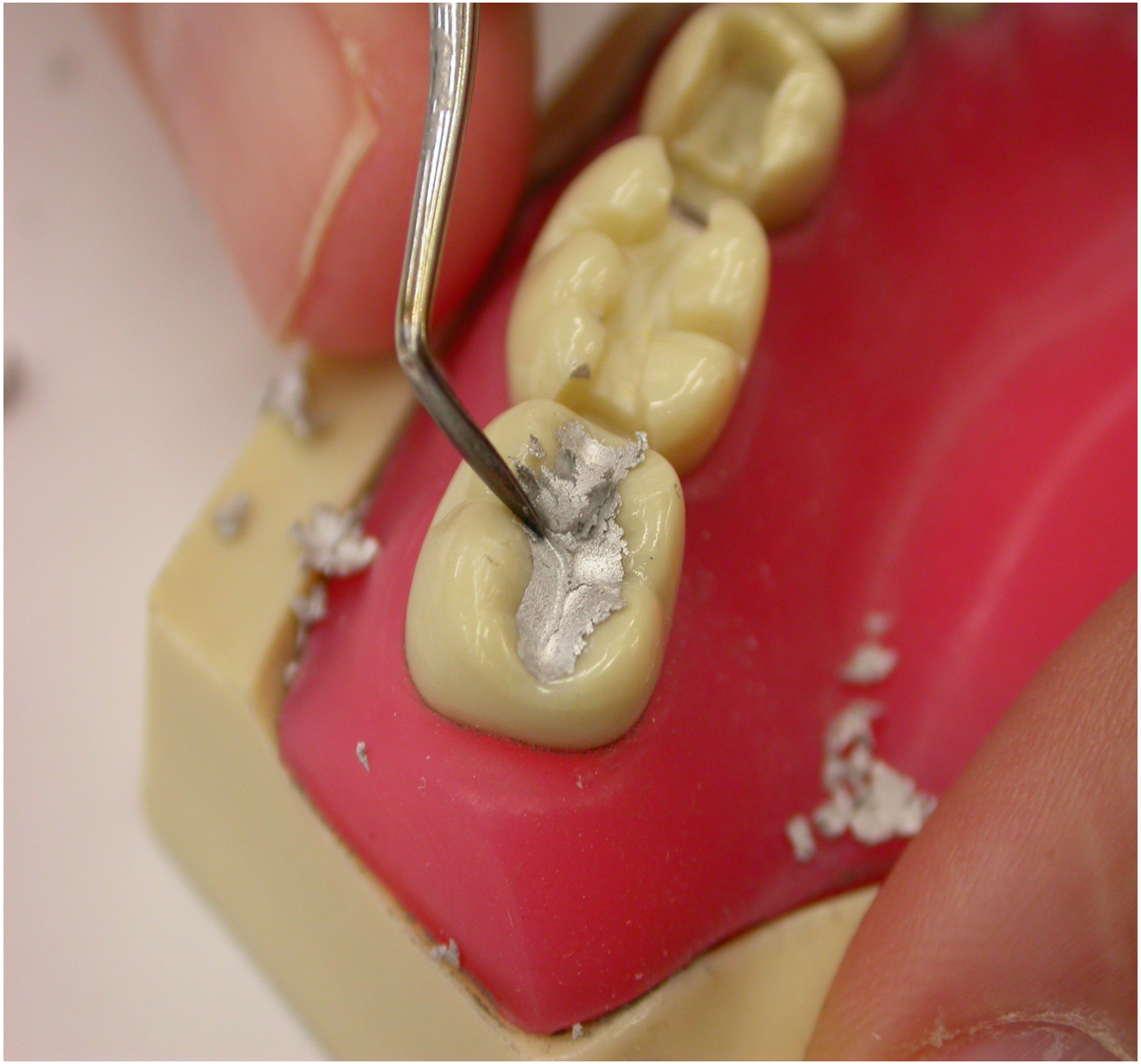
- Complete the restoration by over filling the cavosurface of the tooth with amalgam.
- Use sufficient condensing forces to cause the excess mercury to rise to the surface of the restoration. This will result in a stronger restoration.
- Always use a fulcrum (finger rest) to control the condensing force.

Carving

- Remember your cavity outline- re-establish it by keeping the carver on the tooth structure at all times.
- Anatomy is not an option!!
- Should have buccal grooves, marginal and triangular ridges when appropriate.

Carving (cont’d)

- Be sure to include mesial and distal pits when appropriate.
- Central occlusal groove should be present, but not overly deep or prominent.
- Carve the anatomy of the tooth in four lobes (two for premolars) corresponding to the natural cusps of the tooth.



Burnishing

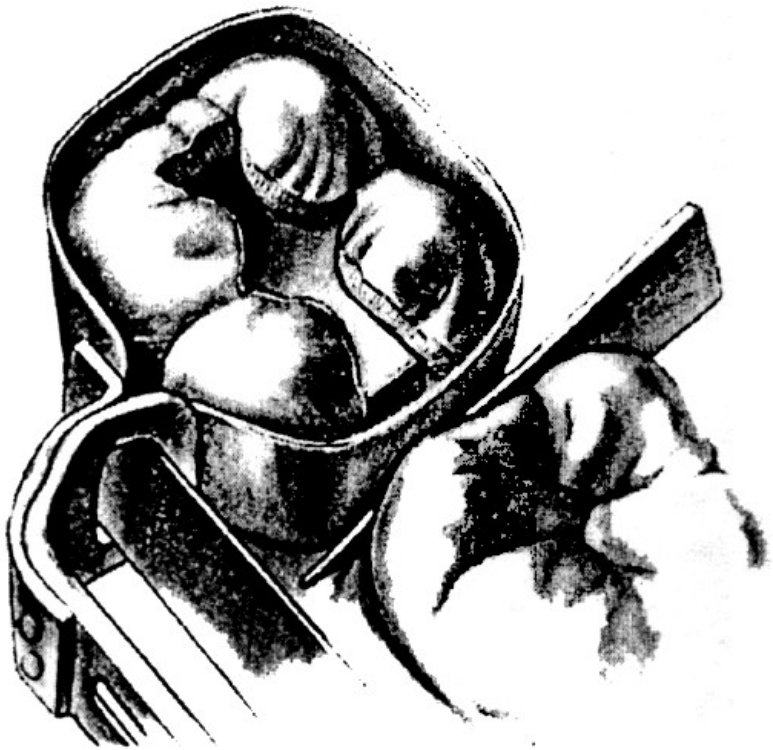
- Burnish amalgam restorations to:
  - -seal up margins
  - -smooth cavosurfaces

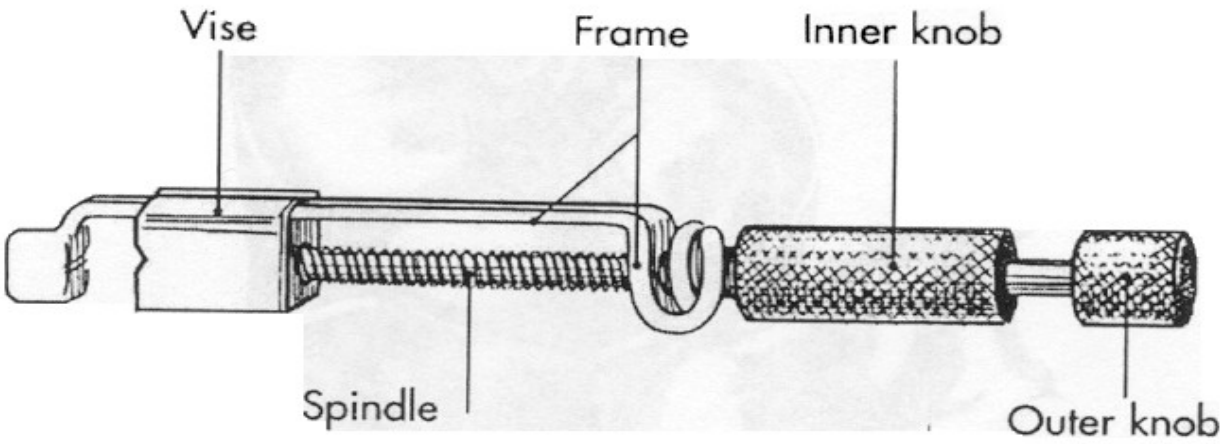
*Amalgam should not be burnished until amalgam is almost set-up!!

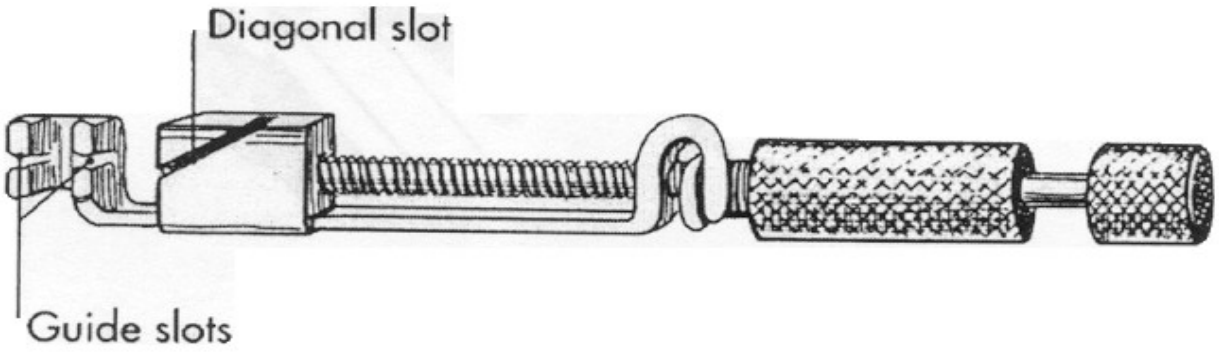
Occlusion

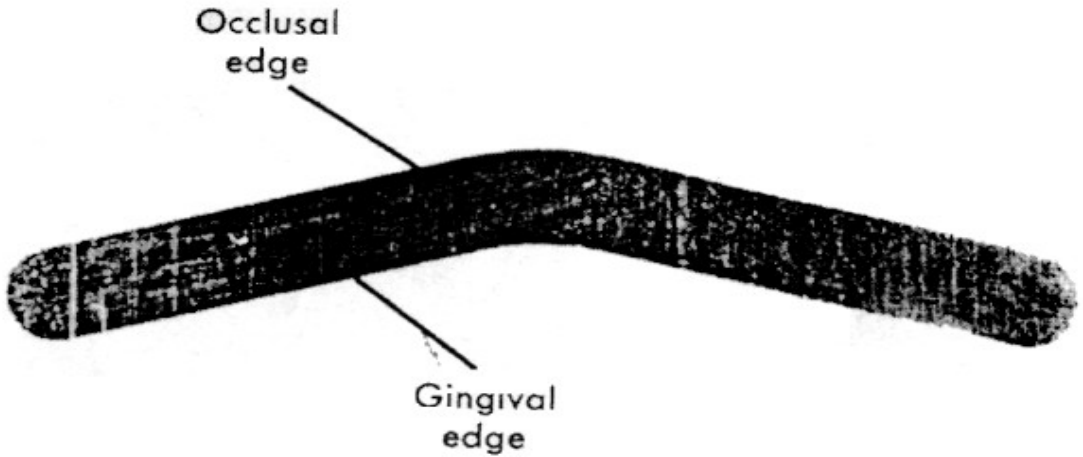
- Utilize articulating paper to ensure the restoration is not too high
- Have PT bite down lightly and laterally to identify premature contacts
- Pass dental floss through contact area to check proximal contact and remove debris (Class II only)

Tofflemire Matrix System




Vise
Frame
Inner knob
Spindle
Outer knob


Diagonal slot
Guide slots


Occlusal edge
Gingival edge

Matrix Bands

- Used for class II restorations
- Two most common bands:
  - -Universal banc
  - -MOD band
- Trim up to your n

Wooden Wedge

- Minimizes amalgam being forced beyond the margin which in turn, creates overhangs.
- Separates teeth to compensate for thick band.
- Also can be contoured to achieve desired effect

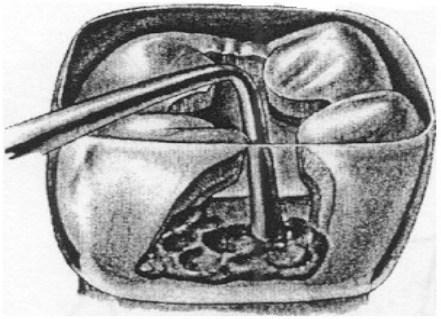
Condensing with Matrix Bands

- Placing the first carrier load of amalgam into proximal box enables the least accessible area to be condensed first.
- When condensing, condense toward the band itself to ensure proper contact.
- Loosen tofflemire when condensing (only when necessary).

Class II Amalgam Con’t

- Use the interproximal carver (IPC) to remove excess amalgam from all margins of the proximal box.
- After initial set of amalgam, remove, wedge and matrix band.
- Check occlusion.

Review



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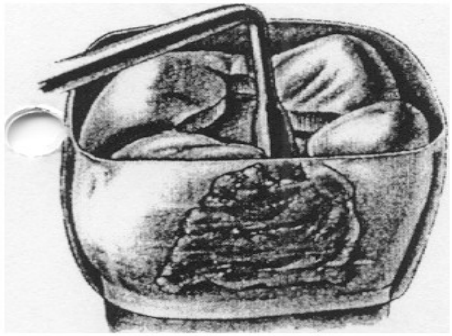

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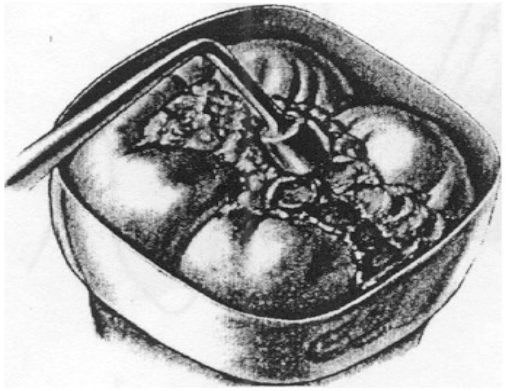

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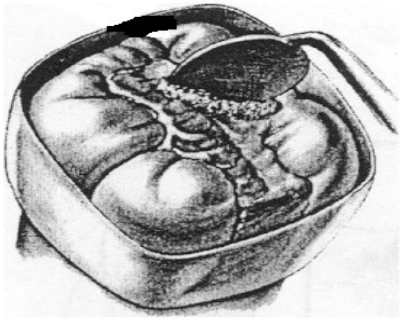

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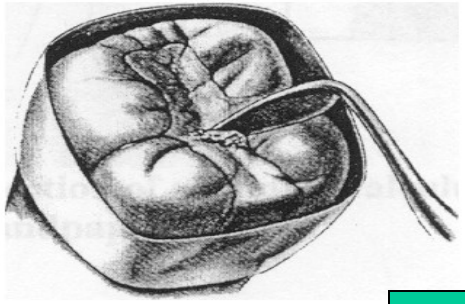

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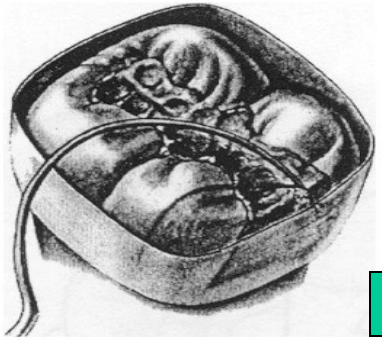

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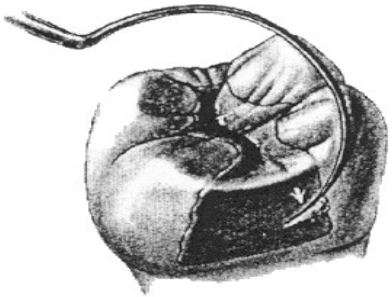

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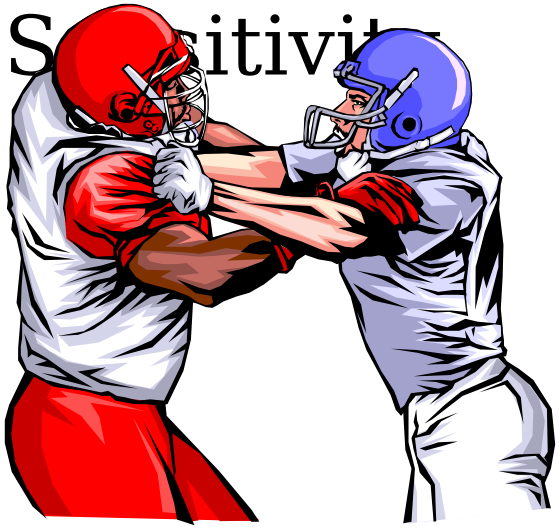
OVERCONTOURED vs. UNDERCONTOURED

Overcontoured	Undercontoured
“Flash”	“Ditch”
Undercarved	Overcarved
Fracture	Harbors Plaque
Pain	Sensitivity



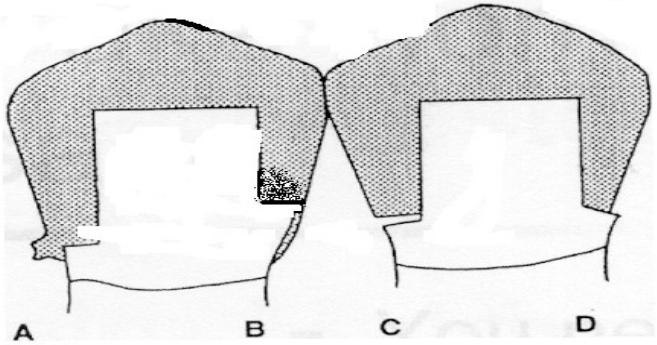
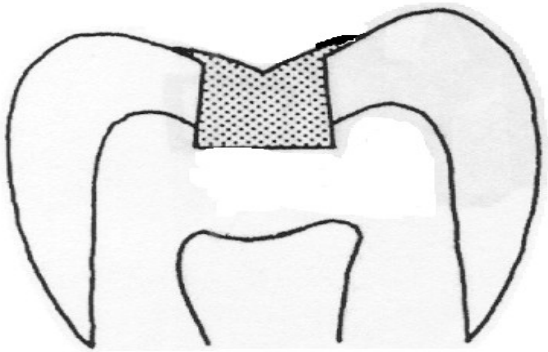
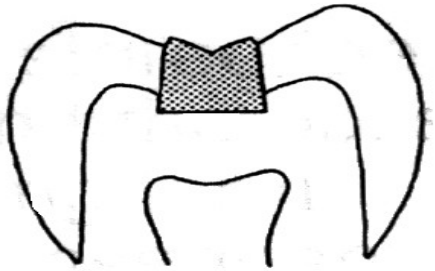


FIGURE 40-1 Proximal Irregularities. (A) Overhang. **(B)** Flash. **(C)** Open or deficient margin. **(D)** Undercontoured margin that can result from an improperly placed matrix band or misdirected carving.

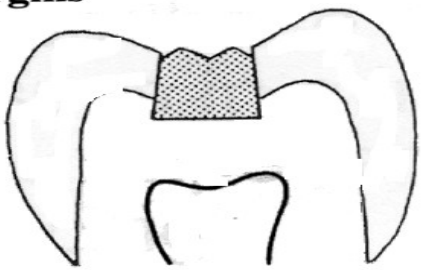
Restored Conditions with cast restorations



Restored Condition:
Flash with a direct placement restoration



Restored Condition:
Overfilled restoration/fractured flash margins

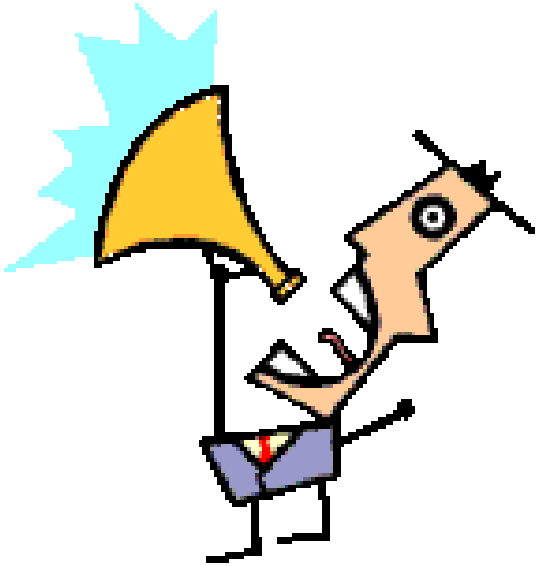


Restored Condition:
Overfilled restoration/fractured flash margins & resulting ditching in the restoration surface; overcarved/ deficient margins will appear similarly

RSC 01

Minimum Standards

- Amalgam must be well condensed.
- All margins must be sealed.
- Proximal contact must be restored where appropriate.
- Occlusal contact should be satisfactory.



QUESTIONS????